

In the Claims:

Claim 40 (currently amended): A method for identifying a non-oligomeric ligand that binds to a target protein wherein said ligand is not a peptide and is less than about 2000 daltons in size, said method comprising:

- a) obtaining said target protein comprising a -SH group, masked -SH group, or activated -SH group;
- b) combining said target protein with one or more non-oligomeric ligand candidates wherein said ligand candidates each comprises a disulfide bond, and wherein said ligand candidates are not peptides and are each less than about 2000 daltons in size;
- c) forming a covalent target protein-ligand conjugate wherein at least one ligand candidate binds to the target protein and forms a disulfide bond with the target protein under disulfide exchange conditions; and
- d) detecting the formation of said covalent target protein-ligand conjugate and identifying the non-oligomeric ligand present in said conjugate.

Claim 41 (previously added): The method of claim 40 wherein the ligand is less than 1500 daltons.

Claim 42 (canceled)

Claim 43 (previously added): The method of claim 40 wherein the ligand is less than 750 daltons.

Claim 44 (canceled)

Claim 45 (previously added): The method of claim 40 wherein step b) is performed in the presence of a reducing agent.

Claim 46 (previously added): The method of claim 40 wherein step c) is performed in the presence of a reducing agent.

Claim 47 (previously added): The method of claim 45 or claim 46 wherein the reducing agent is 2-mercaptoethanol.

Claim 48 (previously added): The method of claim 40 wherein the formation of the target protein-ligand conjugate is detected using mass spectrometry.

*Sub C* Claim 49 (previously added): The method of claim 48 wherein the target protein-

ligand conjugate is subjected directly to mass spectrometry analysis.

Claim 50 (previously added): The method of claim 48 wherein the target protein-

ligand conjugate is fragmented prior to mass spectrometry analysis.

Claim 51 (previously added): The method of claim 49 or claim 50 wherein the

mass spectrometry analysis also identified the ligand is said conjugate.

*B1* *cmj* Claims 52-58 (canceled)

Claim 59 (currently amended) A method for identifying a non-oligomeric ligand that binds to a target protein wherein said ligand is not a peptide and is between about 200 and about 2000 less than about 750 daltons in size, said method comprising:

- a) obtaining said target protein comprising a -SH group, masked -SH group, or activated -SH group;
- b) combining said target protein with one or more non-oligomeric ligand candidates in a mixture wherein said ligand candidates are not peptides and are each less than about 2000 750 daltons in size;
- c) forming a target protein-ligand conjugate wherein at least one ligand candidate binds to the target protein and forms a covalent disulfide bond with the target protein under disulfide exchange conditions;
- d) separating the covalent target protein-ligand conjugate from the mixture; and
- e) identifying the ligand present in said conjugate.

Claim 60 (previously added) The method of claim 59 wherein the ligand is identified using mass spectrometry.

Claims 61-63 (canceled)